

### 3.3 The Trigonometric Functions

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Find the exact values of  $\sin \alpha$ ,  $\cos \alpha$ ,  $\tan \alpha$ ,  $\csc \alpha$ ,  $\sec \alpha$ , and  $\cot \alpha$  where  $\alpha$  is an angle in standard position whose terminal side contains the given point. (Reduce fractions if possible.)

1) (9, 12) 1) \_\_\_\_\_

2) (-9, 5) 2) \_\_\_\_\_

3) (-3, -2) 3) \_\_\_\_\_

Find the exact value of the following expression without using a calculator. Some of the expressions are undefined.

4)  $\sin\left(\frac{-\pi}{2}\right)$  4) \_\_\_\_\_

5)  $\cos 90^\circ$  5) \_\_\_\_\_

6)  $\tan 270^\circ$  6) \_\_\_\_\_

7)  $\cot(-\pi)$  7) \_\_\_\_\_

8)  $\csc\left(\frac{5\pi}{2}\right)$  8) \_\_\_\_\_

Find the exact value of the following expression without using a calculator.

9)  $\sin\left(\frac{\pi}{4}\right)$

9) \_\_\_\_\_

10)  $\cos 45^\circ$

10) \_\_\_\_\_

11)  $\tan\left(\frac{-\pi}{4}\right)$

11) \_\_\_\_\_

12)  $\sec\left(\frac{7\pi}{4}\right)$

12) \_\_\_\_\_

13)  $\cos 135^\circ$

13) \_\_\_\_\_

14)  $\sin 30^\circ$

14) \_\_\_\_\_

15)  $\tan\left(\frac{5\pi}{6}\right)$

15) \_\_\_\_\_

16)  $\cot\left(\frac{13\pi}{6}\right)$

16) \_\_\_\_\_

Find the exact value of the expression.

17)  $\frac{\cos(7\pi/6)}{\sin(7\pi/6)}$

17) \_\_\_\_\_

18)  $\sin\left(\frac{\pi}{4}\right) + \cos\left(\frac{\pi}{4}\right)$

18) \_\_\_\_\_

Use a calculator to find the function value to four decimal places. (Be sure you have your calculator in the correct mode.)

19)  $\sin(74^\circ)$  19) \_\_\_\_\_

20)  $\cos(9^\circ 23')$  20) \_\_\_\_\_

21)  $\tan\left(\frac{\pi}{12}\right)$  21) \_\_\_\_\_

Find the exact value of the expression. Do not use a calculator.

22)  $\csc \alpha$ , if  $\sin \alpha = \frac{3}{4}$  22) \_\_\_\_\_

23)  $\sec \alpha$ , if  $\sin \alpha = -\frac{3}{5}$  and  $\cos \alpha < 0$  23) \_\_\_\_\_

Find the quadrant that contains the terminal side of angle  $\alpha$ .

24)  $\csc \alpha > 0$  and  $\cot \alpha > 0$  24) \_\_\_\_\_

25)  $\sin \alpha < 0$  and  $\tan \alpha > 0$  25) \_\_\_\_\_

26) Convert  $\frac{13\pi}{12}$  radians to degree measure. 26) \_\_\_\_\_

27) A sector of a circle with radius 8 meters has a central angle of  $\frac{\pi}{8}$ . Find the area of the sector to the nearest tenth of a square meter. 27) \_\_\_\_\_

28) A 30-inch lawnmower blade is rotating at 2000 revolutions per minute. Find the linear velocity of the tip of the blade in miles per hour to the nearest tenth. 28) \_\_\_\_\_

## Answer Key

Testname: 3.3 THE TRIGONOMETRIC FUNCTIONS & UNIT CIRCLE

1)  $\frac{4}{5}$

2)  $\frac{5}{\sqrt{106}}$

3)  $-\frac{\sqrt{13}}{3}$

4)  $-\frac{1}{2}$

5)  $\sqrt{3}$

6)  $\sqrt{3}$

7)  $\sqrt{2}$

8) 2

9)  $\sqrt{2}$

10)  $\frac{\sqrt{2}}{2}$

11) -1

12) -1

13)  $-\frac{\sqrt{3}}{3}$

14)  $\frac{\sqrt{2}}{2}$

15)  $\frac{\sqrt{3}}{3}$

16)  $\frac{\sqrt{3}}{3}$

17)  $\frac{\sqrt{3}}{3}$

18) -7

19) -0.9703

20) 0.1650

21) -0.3827

22) 4

23)  $\frac{5}{4}$

24) I

25) III

26)

27)

28)